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E.0 EXECUTIVE SUMMARY

E.1 Project Description Objectives

The US 29 facility is currently a limited-access, four-lane divided freeway passing through the eastern portion of the City of Greensboro in Guilford County, North Carolina. This north-south freeway has been identified as a Congressional High Priority Corridor. The section of the US 29 corridor selected for study in this project extends from I-85/I-40 to Summit Avenue, a distance of 3.6 miles with fourteen access/egress locations. This study evaluates short-term improvements to the US 29 study corridor that can be implemented with the limited funds available to the City of Greensboro and the North Carolina Department of Transportation.

The **goal** of a transportation facility such as US 29 is to support and enhance the social and economic vitality of Greensboro's communities while providing access and mobility through the eastern portion of the city. The **purpose** of this study is to maintain US 29 as a viable transportation corridor that serves the immediate needs of improved access, safety and connectivity while maintaining accessibility to adjacent land uses.

E.2 Existing Conditions and Need for Improvements

The US 29 facility has 14 interchange/access points within the 3.6-mile study corridor. The freeway suffers from a variety of geometric design deficiencies including inadequate spacing of interchanges and ramp terminals, provision of partial interchanges (ramps only provided in one direction), poor connectivity to the local street system, narrow shoulders and breakdown lanes, and short acceleration and deceleration lanes. The substandard freeway design along with the closely spaced interchanges, and inadequate weaving sections all contribute to unsafe travel conditions and decreased mobility within the study corridor.

Below is a summary of the analyses conducted as part of the review of the existing conditions for the US 29 study corridor.

- **Capacity and Functional Analysis.** The capacity analysis conducted for the 2003 traffic flow conditions along the US 29 study corridor indicates that travel demand throughout the corridor is accommodated within the current capacity of the US 29 facility during both peak and non-peak travel times. Those locations at which congestion and travel delays sometimes occur are generally attributable to the substandard roadway geometrics, closely spaced interchanges, and inadequate weaving distances.
- **Operational and Safety Analysis.** The study evaluates the role of US 29 with respect to surrounding roadway facilities and the potential for improved connectivity among communities in eastern Greensboro. The study identified the locations of current operational and safety problems throughout the study corridor including

interchange and local street intersections that should be addressed in the recommended access management plan.

The study also analyzes the accident history of the study corridor and provides an indication of current roadway safety conditions. For the period from 2000 through 2002, there were 361 total accidents for the 3.6-mile study corridor. The most common type of accidents are loss of control (38%), rear-end collisions (37%), and sideswipes and improper lane change (24%). The highest total number of accidents occurred in the vicinity of Florida Street and Lee Street with 143 accidents occurring during the three-year study period. This corresponds to a rate of 175 accidents per 100 million vehicle miles of travel, which is about the same as the statewide average of 180 accidents per 100 million vehicle miles of travel for a four-lane, divided urban highway with full access control. The segment between Sullivan Street and Textile Drive is another high accident area, with a rate of 215 accidents per 100 million vehicle miles of travel, which is a rate approximately 20 percent higher than the statewide average.

E.3 US 29 Corridor Improvement Alternatives Considered

As part of the US 29 study process, alternative improvement plans were analyzed as to their effectiveness in meeting the project goals of improving operating and safety conditions within the study area as well as maximizing traffic capacity and street local connectivity along the US 29 corridor.

- **Corridor Improvement Alternatives.** Various design and operational improvements to interchanges, access and egress points, and intersections along the study corridor were evaluated to determine the improvements that would best meet the project needs and were financially feasible. The alternatives that were considered include closure options of certain access and egress points along the corridor including changes in lengths of auxiliary lanes and acceleration/deceleration lanes to improve the merge and diverge movements in these areas.
- **Community Involvement.** The study documents the public information process and input received from the community regarding the proposed improvements. A series of public meetings were held to inform the public about the project and to present alternative improvement plans for the US 29 study corridor and receive comments. Regular meetings were also held with the US 29 steering committee at decision-making points of the study process.

E.4 Recommended Improvements to US 29 Corridor

This US 29 Corridor Access Management Study includes a recommended improvement plan that addresses the mobility and safety issues within the US 29 study corridor while maintaining accessibility and connectivity to adjacent land uses. The recommended plan for the US 29 corridor is shown in Figures E-1 through E-8 and is summarized below.

- **Recommended Interchange Location and Spacing.** Perhaps the most controversial component of the study is the recommended closure of interchange ramps and consolidating interchange access on major arterial cross-streets. Although the recommended changes will improve safety of travel and increase mobility by reducing conflicts on the mainline, the changes must be properly planned in order to minimize potentially adverse effects to the surrounding communities. The US 29 Corridor Access Management Plan recommends the consolidation of the existing 14 access/egress locations within the study corridor to a total of nine locations by eliminating access/egress at the following five locations: Bothwell Street; Spencer Street; Woodside Drive; Textile Drive; and Phillips Avenue. Full interchanges with US 29 will remain at three locations: Lee Street; Market Street; and Wendover Avenue. Partial access to and egress from US 29 will be provided at six locations: Florida Street; Lutheran Street; Sullivan Street; Bessemer Avenue; Gatewood Avenue; and Summit Avenue. Table E-1 summarizes the recommended improvements to the access/egress locations along the US 29 study corridor.

Table E-1
Recommended Improvements
Access/Egress Locations

US 29 Cross-Street	Existing Conditions					Recommended Improvements				
	Type of Access	Southbound		Northbound		Type of Access	Southbound		Northbound	
		Exit	Entrance	Exit	Entrance		Exit	Entrance	Exit	Entrance
Bothwell St.	Partial	-	-	✓	✓	Closure Recommended				
Florida St.	Full	✓	✓	✓	✓	Partial	-	-	✓	✓
Lee St.	Full	✓	✓	✓	✓	Full	✓	✓	✓	✓
Spencer St.	Partial	✓	✓	-	-	Closure Recommended				
Market St.	Full	✓	✓	✓	✓	Full	✓	✓	✓	✓
Lutheran St.	Full	✓	✓	✓	✓	Partial	✓	✓	-	-
Sullivan St.	Partial	-	-	✓	✓	Partial	-	-	✓	✓
Bessemer Ave.	Full	✓	✓	✓	✓	Partial	-	✓	✓	-
Wendover Ave.	Full	✓	✓	✓	✓	Full	✓	✓	✓	✓
Woodside Dr.	Partial	✓	✓	-	-	Closure Recommended				
Gatewood Ave.	Full	✓	✓	✓	✓	Partial	-	-	✓	✓
Textile Dr.	Full	✓	✓	✓	✓	Closure Recommended				
Phillips Ave.	Partial	-	-	✓	-	Closure Recommended				
Summit Ave.	Partial	✓	-	-	✓	Partial	✓	-	-	✓

- **Recommended Improvement of Auxiliary Lanes and Merge/Diverge Areas.** The study identifies the locations within the study corridor where the lengths of the auxiliary lanes and acceleration/deceleration lanes for US 29 interchanges are insufficient. The recommended closure of several access and egress locations along the study corridor allows for the extension of certain auxiliary lanes and ramp acceleration/deceleration lanes in several locations along the corridor. These recommended closures will significantly improving the safety of travel on both the US 29 mainline and within the merge and diverge areas.
- **Recommended Intersection Improvements.** The study identifies various intersections within the study area that have operational and/or safety deficiencies and recommends improvements that would address these problems and increase both the function and safety at the intersections.

Figure E-1
Recommended Improvements

1.0 INTRODUCTION

The US 29 facility is currently a limited-access, four-lane divided freeway passing through the eastern portion of the City of Greensboro in Guilford County, North Carolina. This north-south freeway has been identified as a Congressional High Priority Corridor. The section of the US 29 corridor selected for study in this project extends from I-85/I-40 to Summit Avenue, a distance of 3.6 miles with fourteen access/egress locations. This study evaluates short-term improvements to the US 29 study corridor that can be implemented with the limited funds available to the City of Greensboro and the North Carolina Department of Transportation.

1.1 Purpose and Need

The **goal** of a transportation facility such as US 29 is to support and enhance the social and economic vitality of Greensboro's communities while providing access and mobility through the eastern portion of the city. To accomplish this, US 29 should meet the travel needs of area motorists while supporting the adjacent land uses in a manner compatible with the surrounding environment. The **purpose** of this study is to maintain US 29 as a viable transportation corridor that serves the immediate needs of improved access, safety and connectivity along this corridor.

1.2 Study Organization

This US 29 Corridor Access Management Study includes an analysis of the current traffic flow conditions and safety along the study corridor; an evaluation of alternative improvement strategies; and a recommended plan that addresses the mobility and safety issues within the US 29 corridor while maintaining accessibility to adjacent land uses. The study includes:

- **Operational and Functional Analysis.** The study evaluates the role of US 29 with respect to surrounding roadway facilities and the potential for improved connectivity among communities in eastern Greensboro.
- **Community Involvement.** The study documents the public informational process and input received from the community regarding the proposed improvements.
- **Safety Analysis.** The study analyzes the accident history of the study corridor and provides an indication of current roadway safety conditions.
- **Recommended Interchange Location and Spacing.** Perhaps the most controversial component of the study is the recommended closure of interchange ramps and consolidating interchange access on major arterial cross-streets. Although the recommended changes will improve safety of

travel and increase mobility by reducing conflicts on the mainline, the changes must be properly planned in order to minimize potentially adverse effects to the surrounding communities.

- **Recommended Improvement of Auxiliary Lanes and Merge/Diverge Areas.** The study identifies the locations within the study corridor where the lengths of the auxiliary lanes and acceleration/deceleration lanes for US 29 interchanges are insufficient. The recommended closure of several access and egress locations along the study corridor allows for the extension of certain auxiliary lanes and ramp acceleration/deceleration lanes in several locations along the corridor. These recommended closures will significantly improving the safety of travel on both the US 29 mainline and within the merge and diverge areas.
- **Recommended Intersection Improvements.** The study identifies various intersections within the study area that have operational and/or safety deficiencies and recommends improvements that would address these problems and increase both the function and safety at the intersections.

2.0 COMMUNITY INVOLVEMENT

An important element of this project is the consideration of public input from the community. To accommodate the project schedule and available resources, the community participation process focused on the use of a steering committee to guide the effort, as well as meetings with selected stakeholders along the US 29 study corridor and public meetings to gain input from the community and to present the proposed plan. As exemplified from the responses offered at the community meetings, the plan will be successful only through community involvement in the decision-making process.

2.1 Steering Committee

A Steering Committee was formed by the City of Greensboro that includes representatives from the GDOT staff and NCDOT Division Traffic Engineering staff. The purpose of the steering committee was to provide technical input into the planning process.

The first meeting of the steering committee occurred on, July 16, 2003. RS&H, the project consultant, presented the existing conditions analysis including the corridor safety conditions and the traffic flow analysis. This was followed by an evaluation of possible changes to access and roadway conditions in the US 29 study corridor that would improve safety and be acceptable to the community.

A second steering committee meeting was held on November 3, 2003 to discuss the proposed design improvements and their impact on the travel conditions along the US 29 study corridor. As a result of comments from these meetings the plans were revised and subsequently presented to the general public for comment.

2.2 Community Meetings

Two public meetings were held to present information about the US 29 corridor project. RS&H prepared a public meeting announcement that GDOT sent to community members and notices were distributed through local media outlets.

2.2.1 September 2003 Public Meetings

The first public meetings were held to inform the public about the study and seek input about current conditions in the US 29 corridor. The meetings were held on consecutive evenings from 5:30 to 7:30 PM on September 4 and 5, 2003, at the Peeler Recreation Center and at the Windsor Recreation Center. Displays were set up in the gymnasium highlighting the existing accident and traffic flow conditions in the study corridor.

Representatives from the US 29 corridor project team were available to discuss issues and answer questions from the community. Carrie Reeves (GDOT) and Jan Anderson (RS&H) gave an introduction to the project including project purpose, existing safety and capacity conditions and future activities within the corridor. The meeting attendees were asked to review the aerial photographs of the US 29 corridor and indicate with stick-on notes the issues they felt were important and the problem areas within the corridor. About 100 community members participated in the first public meetings.

Many of the meeting attendees mentioned that special attention should be given to addressing the following problems:

- Accidents occurring near access/egress ramps (especially accidents on the ramps) are damaging the residents' properties.
- The corridor is unsafe to travel due to heavy truck volumes and speeding vehicles.
- The corridor is unsafe to travel due to inadequate lighting along the US 29 mainline and ramps. Lighting on the US 29 study corridor is maintained by Duke Energy.
- Signage along the US 29 corridor and its ramps are confusing at several locations.
- The corridor is unsightly and care should be taken to make aesthetic and landscaping improvements including collecting the trash on the corridor, mowing the grass and tree maintenance.
- Residents adjacent to the corridor (especially in the Florida Street interchange area) commented on the traffic noise levels and remarked that noise walls should be installed all along the corridor.
- Deceleration and acceleration lanes are not adequate along the corridor.
- Travel conditions along the corridor are unsafe because of high traffic volumes, poor roadway geometry and closely spaced ramps.

The comments from these public meetings were used to develop an access management plan for the US 29 study corridor that responded to the community's needs while recognizing the limited scope of this project.

2.2.2 November 2003 Public Meetings

The second series of public meetings were held on November 18 and 19, 2003 from 5:30 PM to 7:30 PM at the Peeler Recreation Center and at the Windsor Recreation Center. The existing accident analysis was again presented as well as the proposed access management improvements for the corridor.

Representatives from the US 29 corridor project team were available to discuss issues and answer questions from the community. Carrie Reeves (GDOT) and Jan Anderson (RS&H) gave an introduction to the project including project purpose, existing safety and capacity conditions, as well as the proposed design improvements for the US 29 corridor. The meeting attendees were then encouraged to review the aerial photographs of the corridor and indicate with stick-on notes whether the proposed plans responded to their concerns. About 110 community members participated in the second series of meetings.

Generally, the proposed changes to access along the US 29 corridor were well received, with several community members stating that it appeared that the project team had listened to the community and responded to their concerns. Several issues were highlighted for further review before the final plan was adopted:

- There were mixed responses to the proposed closing of the ramps at Hooks Street.
- Use the northbound US 29 exit ramp to eastbound Bessemer Avenue rather than the northbound US 29 exit ramp to eastbound Wendover Avenue.
- Close the westbound Wendover Avenue-to-southbound US 29 entrance ramp and redirect traffic to the eastbound Bessemer Avenue-to-southbound US 29 entrance ramp.
- Reconsider closing the northbound US 29 exit and entrance ramps at Gatewood Avenue rather than Textile Drive. Some residents felt that Textile Drive provides better access through the community.
- Reconsider whether the Textile Drive ramps-to-southbound US 29 should be closed. There were mixed comments about the proposal to close Textile Drive.

The project team reviewed comments from the public meetings and concluded the following improvements:

1) Access to and egress from Eton Drive on southbound US 29 would be eliminated.
2) On Northbound US 29, exit and entrance ramps at Textile Drive and entrance ramp at Ryan Street would be closed and this traffic would use Gatewood Avenue to access and egress from northbound US 29.
3) All access to and egress from US 29 through the Rosewood community would be eliminated.

2.2.3 Other Meetings with the Community

There were several key stakeholders in the community that were contacted to review the proposed improvements to the US 29 study corridor.

Duke Energy. In addition to the general public meetings, individual meetings were held with Duke Energy representatives to discuss the street lighting conditions along the US 29 corridor. Duke Energy is responsible for the maintenance of the lighting along this segment of US 29. Of the 221 street lights in the study area, 110 were either broken or out because of problems with nearby fixtures. The system is antiquated and needs to be replaced.

Duke Energy expressed concern about the difficulty of making repairs in the corridor. NCDOT agreed to notify Duke Energy as to their maintenance schedule for the corridor in order to coordinate their maintenance efforts.

North Carolina A&T State University. During the alternatives review phase of the project, a meeting was held with NCA&T State University to discuss changes in access to and from US 29 in the vicinity of the campus. The University feels strongly that access to and egress from the Lutheran Street southbound ramps on US 29 is essential in maintaining adequate access to the campus. Their concerns were taken into consideration in the final plan.

3.0 EXISTING CONDITIONS

The existing conditions section of this study describes the current travel patterns within the US 29 study corridor and forms the basis for developing transportation plans that meet both current and future needs within the study area. For this project, "existing conditions", are defined as the status and travel conditions of the US 29 study corridor as of May 2003.

3.1 General Project Surroundings

The primary study area is the US 29 corridor in the City of Greensboro. The project extends from I-85/I-40 at the southern limits of the study corridor to the Phillips Avenue interchange, a distance of approximately 3.6 miles. Figure 3-1 shows the project study area.

3.1.1 Physical Features of US 29 Study Corridor

The existing physical features of the US 29 freeway facility include the roadway typical section and auxiliary lane configuration.

Typical Section:

The mainline of the US 29 facility within the study corridor is currently a divided four-lane, controlled access north-south highway with a posted speed limit of 55 miles per hour. The US 29 mainline has two travel lanes in each direction; the travel lanes have a variable width of 11 to 12 feet. The US 29 mainline is divided by a median barrier wall.

Based on the varying roadway geometry from I-85/I-40 to Summit Avenue, the study corridor is divided into three sections.

- Section 1: From the southern project limit at I-85/I-40 to Lee Street, the roadway typical section has paved shoulders (inside and outside) varying from six to ten feet in width.
- Section 2: From Lee Street to Textile Drive, the roadway typical section has five-foot paved inside shoulders and 2'-6" curb and gutter along the outside lane in both directions. Sidewalks are located on each side of the roadway from Lee Street to Market Street.
- Section 3: From Textile Drive to the northern study limit at Summit Avenue the roadway has five-foot inside shoulders and 2-foot outside shoulders with guardrails in both directions.

Figure 3-1
Project Study Area

Auxiliary Lanes:

Auxiliary lanes on highways are supplementary lanes adjoining the highway to accommodate changes in speed, vehicle storage for turning movements, traffic weaving movements and other safety-related purposes. An auxiliary lane can be continued up to the successive upstream interchange auxiliary lane if the distance between interchanges is less than 1500 feet. Generally, if the distance between interchanges is more than 1500 feet, the auxiliary lane can be tapered into the through roadway.

To facilitate safe vehicular travel movements on US 29, auxiliary lanes have been constructed along the US 29 study corridor between all of the interchanges in both the northbound and southbound directions with the exception of the segment between Florida Street and Lee Street where the auxiliary lanes are not continuous but function as merge and diverge sections. At each auxiliary lane location within the study corridor, there is a continuous lane between successive entrance and exit interchange ramps, and the auxiliary lanes function as weaving sections.

3.1.2 Cross-Streets and Interchanges

The interrelationship of the US 29 freeway facility with the surrounding transportation network is an important element to consider in a corridor study. Within the 3.6-mile US 29 study corridor there are 16 roadways that either cross or intersect with US 29. Eight cross-streets have full access with US 29; six roadways have partial access to US 29; and two roadways cross US 29 but have no access to US 29. All but one of the 16 streets travel in an east-west direction. Summit Avenue runs in a north-south direction. Table 3-1 summarizes the following information on each corridor cross-street.

- Functional Classification
- Typical Section
- Type of Interchange
- Access to the Study Corridor

In some locations, parallel frontage roads are utilized along the east and west sides of the US 29 corridor. Northbound US 29 has frontage roads from McConnell Street to Sullivan Street and from Textile Drive to Ryan Street. Southbound US 29 has frontage roads from south of Summit Avenue to Textile Drive and from Sullivan Street to Gorrell Street.

In the southern section of the US 29 corridor from I-85/I-40 to Bessemer Avenue, there are closely-spaced interchanges at Bothwell Street, Florida Street, Lee Street, Spencer Street, Market Street, Lutheran Street and Sullivan Street. Tuscaloosa Street and McConnell Street cross US 29 but do not have access to the corridor. Thus, there are seven interchanges within the southern half of the US 29 study corridor.

In the northern section of the US 29 corridor from Bessemer Avenue to Summit Avenue, the following routes cross US 29 at less than ¼-mile spacing: Bessemer Avenue,

Wendover Avenue, Woodside Drive, Gatewood Avenue, Textile Drive, Phillips Avenue and Summit Avenue. Thus, there are a total of eight interchanges and six corridor crossings within the northern half of the US 29 study corridor.

According to the American Association of State Highway and Transportation Officials (AASHTO) freeway design standards, the recommended interchange spacing in an urban area for a freeway is 1 mile (5280 feet).

Table 3-1
Cross-Streets and Interchange Access

US 29 Corridor Cross-Street	Functional Classification	Typical Section	Type Of Interchange	Southbound Access		Northbound Access	
				Exit	Entrance	Exit	Entrance
Bothwell St.	Local Street	2 lanes	Partial Interchange	-	-	✓	✓
Florida St.	Local Street	2 lanes	Full Interchange	✓	✓	✓	✓
Tuscaloosa St.	Local Street	2 lanes	No Interchange	-	-	-	-
Lee St.	Major Arterial	4 lanes	Full Interchange	✓	✓	✓	✓
McConnell St.	Minor Arterial	2 lanes	No Interchange	-	-	-	-
Spencer St.	Local Street	2 lanes	Partial Interchange	✓	✓	-	-
Market St.	Major Arterial	4 lanes	Full Interchange	✓	✓	✓	✓
Lutheran St.	Local Street	2 lanes	Full Interchange	✓	✓	✓	✓
Sullivan St.	Local Street	2 lanes	Partial Interchange	-	-	✓	✓
Bessmer Ave.	Local Street	4 - 5 lanes	Full Interchange	✓	✓	✓	✓
Wendover Ave.	Major Arterial	6 lanes	Full Interchange	✓	✓	✓	✓
Woodside Dr.	Local Street	2 lanes	Partial Interchange	✓	✓	-	-
Gatewood Ave.	Local Street	2 lanes	Full Interchange	✓	✓	✓	✓
Textile Dr.	Local Street	2 lanes	Full Interchange	✓	✓	✓	✓
Phillips Ave.	Minor Arterial	2 lanes	Partial Interchange	-	-	✓	-
Summit Ave.	Minor Arterial	4 lanes	Partial Interchange	✓	-	-	✓

The following is a brief description of the cross-streets that intersect with US 29 in the study corridor.

Bothwell Street is a two-lane, two-way, east-west local street. In the project area, Bothwell Street extends from US 29 east to Alice Avenue and has a northbound entrance and exit ramp with US 29. The posted speed limit on Bothwell Street is 25 miles per hour. This street has direct driveway access and no sidewalks. Traffic is controlled by stop signs on cross-streets in the vicinity of the US 29 corridor.

Florida Street is a two-lane, two-way, east-west major thoroughfare with exit and entrance ramps on both northbound and southbound US 29. The ramp intersections with Florida Street have a separate right turn lane and ramp exiting traffic is controlled with a stop sign. The posted speed limit on Florida Street is 35 miles per hour. Florida Street extends from South Holden Road west of US 29 to Lee Street east of US 29. Florida Street does not have sidewalks and has uncontrolled access.

Tuscaloosa Street is a two-lane, two-way, east-west local street with no access to US 29. Tuscaloosa Street extends from Martin Luther King, Jr. Drive west of US 29 to South English Street east of US 29. The posted speed limit on Tuscaloosa Street is 25 miles per hour. Traffic on the cross-streets along Tuscaloosa Street is controlled by stop signs in the vicinity of the study corridor. There are sidewalks along Tuscaloosa Street, but there is no controlled access or center median.

Lee Street is a four-lane, two-way, east-west major thoroughfare with exit and entrance ramps on both northbound and southbound US 29. Lee Street, also known as NC 6, extends from Patterson Street west of US 29 to Youngs Mill Road east of US 29. The US 29 ramp intersections on Lee Street are controlled by stop signs. In the project vicinity, there are traffic signals on Lee Street at its intersections with Benbow Street and Lincoln Street. The posted speed limit on Lee Street is 45 miles per hour. Lee Street does not have sidewalks or a center median and has uncontrolled access.

McConnell Street is a two-lane, two-way, east-west minor thoroughfare with no access to US 29. The posted speed limit on McConnell Street is 35 miles per hour. Traffic on the cross-streets along McConnell Street is controlled by stop signs in the vicinity of the study corridor. McConnell Street extends from Benbow Street west of US 29 to Keesee Road east of US 29. There are sidewalks on the McConnell Street, but there is no controlled access or a center median.

Spencer Street is a two-lane, two-way, local street with exit and entrance ramps on only southbound US 29. Spencer Street extends from Booker Street to Avalon Road on the west side of US 29. There are no traffic signals on Spencer Street in the vicinity of the study corridor. The posted speed limit on Spencer Street is 25 miles per hour. Spencer Street does not have sidewalks or a center median and does not have controlled access.

Market Street is a four-lane, two-way, major thoroughfare with exit and entrance ramps on both northbound and southbound US 29. Market Street extends from Pleasant Ridge Road west of US 29 to Wendover Avenue east of US 29. The US 29 ramp intersections on Market Street are controlled by traffic signals. The posted speed limit on Market Street is 45 miles per hour. Market Street has sidewalks but does not have a center median or controlled access.

Lutheran Street is a two-lane, two-way, local street with exit and entrance ramps on both northbound and southbound US 29. Lutheran Street extends from Benbow Street west of US 29 to Winston Street east of US 29 but does not cross US 29. There are no traffic signals on Lutheran Street in the vicinity of the US 29 study corridor. The posted speed limit on Lutheran Street is 25 miles per hour. Lutheran Street does not have sidewalks or a center median and does not have controlled access.

Sullivan Street is a two-lane, two-way, local street with exit and entrance ramps on only southbound US 29. Sullivan Street extends from Cypress Street west of US 29 to North English Street east of US 29 but does not cross US 29. There are no traffic signals on Sullivan Street in the vicinity of the US 29 study corridor. The posted speed limit on Sullivan Street is 25 miles per hour. Sullivan Street does not have sidewalks or a center median and does not have controlled access.

Bessemer Avenue is a four-lane, two-way, collector street with exit and entrance ramps on both northbound and southbound US 29. Bessemer Avenue extends from Cridland Road west of US 29 to Burlington Road east of US 29. The US 29 ramp intersections on Bessemer Avenue are controlled by stop signs. There are traffic signals on Bessemer Avenue at its intersections with Lindsay Street and Huffman Street. The posted speed limit on Bessemer Avenue is 45 miles per hour. Bessemer Avenue does not have sidewalks or a center median and does not have controlled access.

Wendover Avenue is a four-lane, two-way, major thoroughfare with exit and entrance ramps on both northbound and southbound US 29. Wendover Avenue extends from Eastchester Drive west of US 29 to Burlington Road east of US 29. The US 29 ramp intersections on Wendover Avenue are controlled by stop signs. There are traffic signals on Wendover Avenue at its intersections with Lindsay Street and Gatewood Avenue. The posted speed limit on Wendover Avenue is 45 miles per hour. Wendover Avenue does not have sidewalks (except at the bridge crossing of US 29) and does not have controlled access. Wendover Avenue has a median about 15 feet wide in the vicinity of the study corridor.

Woodside Drive is a two-lane, two-way, local street with exit and entrance ramps on only southbound US 29. Woodside Drive extends to the west of US 29 from Summit Avenue to southbound US 29. The posted speed limit on Woodside Drive is 25 miles per hour. There are no traffic signals along Woodside Drive in the vicinity of the study corridor. Woodside Drive does not have sidewalks or a center median and does not have controlled access.

Gatewood Avenue is a two-lane, two-way, local street with exit and entrance ramps on both northbound and southbound US 29. Gatewood Avenue extends from Textile Drive west of US 29 to Bessemer Avenue east of US 29 but does not cross US 29. The posted speed limit on Gatewood Avenue is 25 miles per hour. There are no traffic signals on Gatewood Avenue in the vicinity of the study corridor. Gatewood Avenue does not have sidewalks or a center median and does not have controlled access.

Textile Drive is a two-lane, two-way, local street with exit and entrance ramps on both northbound and southbound US 29. Textile Drive extends from Yanceyville Street west of US 29 to Sykes Avenue east of US 29 but does not cross US 29. The posted speed limit on Textile Drive is 25 miles per hour. There are no major intersections or traffic signals on Textile Drive in the vicinity of the study corridor. Textile Drive does not have sidewalks or a center median and does not have controlled access.

Phillips Avenue is a two-lane, two-way, minor thoroughfare with only an exit ramp from northbound US 29. Phillips Avenue extends from Summit Avenue to Huffine Mill Road east of US 29. The posted speed limit on Phillips Avenue is 45 miles per hour. Phillips Avenue has major intersections with Summit Avenue, Ball Street and White Street/Tucker Street. At the Summit Avenue intersection, traffic is controlled by a traffic signal and at the remaining two intersections, cross-street traffic is controlled by stop signs. Phillips Avenue does not have sidewalks or a center median and does not have controlled access.

Summit Avenue is a four-lane, two-way, north-south major thoroughfare with partial access to US 29, which includes an entrance ramp to northbound US 29 and an exit ramp from southbound US 29. Summit Avenue is a parallel street to the west of US 29 from Lindsay Street to State Highway 150. The posted speed limit on Summit Avenue is 45 miles per hour. The US 29 southbound exit ramp intersection on Summit Avenue (where Phillips Avenue also intersects) is controlled by a traffic signal. Summit Avenue does not have sidewalks or a center median and does not have controlled access.

Bothwell Street Looking South Towards I-85/I-40

3.2 Traffic Analysis

Existing traffic flow conditions were analyzed in order to form the basis for forecasting and evaluating future travel conditions in the US 29 study corridor.

3.2.1 Existing Conditions 2003 Traffic Volumes

The RS&H Project Team collected traffic counts during April 2003 along the US 29 mainline and ramps and at intersections that might be affected by changes in travel patterns within the study corridor. This data were supplemented by traffic counts taken in 2002 by GDOT for the intersections of Market Street at Gillespie Street, Market Street at Booker Street; Phillips Avenue at Summit Avenue and Phillips Avenue at White Street. The data were used to determine the existing (2003) AM and PM peak hour traffic conditions for the study area. Figure 3-2 shows the 2003 traffic volumes for the US 29 corridor.

3.2.2 Roadway Capacity and Level of Service Standards

Roadway capacity is defined as the maximum number of vehicles passing a given point during a specified amount of time before traffic flow exceeds the capacity of a roadway. Level of service reflects the quality of traffic flow using a scale from "A" to "F" with level of service "A" representing unimpeded traffic flow, and level of service "F" representing traffic demand exceeding roadway capacity.

The Highway Capacity Manual[1], Third Edition (HCM) defines the capacity of a freeway lane with a 55 mile per hour speed limit as 2250 vehicles per hour under ideal conditions. The HCM defines ideal conditions as twelve-foot travel lanes and a six-foot minimum clearance to roadside and median objects. Wherever these conditions do not exist, the values of maximum service flow rate (capacity) should be reduced. Hence, based on the geometric conditions along the US 29 study corridor, the capacity of each lane was reduced to 2050 vehicles per hour (vph). Table 3-2 presents the actual and adjusted Level of Service values used for the US 29 study corridor.

Table 3-2
Level of Service Criteria

CRITERIA	LEVEL OF SERVICE Vehicles per Hour				
	A	B	C	D	E
Ideal Capacity - per lane	550	880	1320	1760	2250
US 29 Adjusted Capacity - per lane	500	800	1200	1600	2050
US 29 Adjusted Capacity - two lanes each direction	1000	1600	2400	3200	4100

Source: Highway Capacity Manual [1]

[1] *Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 2000.*

Figure 3-2
Traffic Volumes 2003 Existing Conditions

3.2.3 Existing Conditions Roadway Capacity Analysis

The existing conditions traffic capacity analysis conducted for the mainline US 29 and ramps indicates that the current traffic flow is generally below the route's capacity. Congestion and travel delays that occur along US 29 are generally attributable to roadway geometrics and safety issues rather than the existing capacity of the four-lane freeway or ramps.

US 29 Mainline:

The capacity analysis of 2003 traffic flow conditions conducted for the US 29 study corridor indicates that traffic demand throughout the corridor is accommodated within the current capacity of a four-lane freeway facility during all times of the day. Tables 3-3 and 3-4 summarize the US 29 mainline capacity analysis.

During the AM peak period, southbound traffic on US 29 is approaching capacity and operates at level of service E between the Summit Avenue and Phillips Avenue interchanges. Traffic on US 29 southbound between Phillips Avenue and Lee Street flows at level of service D, an acceptable rate of traffic flow for peak hour conditions. The traffic demand for the remaining southbound segment of the study corridor between Lee Street and I-85/I-40 flows at level of service C, a good rate of traffic flow. US 29 northbound traffic flows at level of service D between I-85/I-40 and Bessemer Avenue, which is an acceptable rate for peak hour conditions. In the remaining northbound section of the US 29 study corridor, traffic flows at level of service C, a good rate of traffic flow.

During the PM peak period, US 29 southbound traffic flows at a level of service C between Summit Avenue and Wendover Avenue, a good rate of traffic flow. In the remaining southbound section of the US 29 study corridor, traffic flows at level of service D. Traffic on US 29 northbound flows at level of service D, an acceptable rate of traffic flow for peak hour conditions.

The traffic volumes on US 29 indicate that during the AM peak period, the travel pattern is towards the employment centers in the vicinity of Market Street and Wendover Avenue and travel patterns are outbound from this area in the PM peak period.

US 29 Northbound at Market Street

Table 3-3
Mainline Capacity Analysis
AM Peak Hour
2003 Existing Conditions

Mainline Section and Corridor Cross-Street	Volume[1]	Capacity[1]	Level of Service	Volume[1]	Capacity[1]	Level of Service
US 29	Southbound Lanes			Northbound Lanes		
From Interstate 85/40 to Bothwell Street	2320	4500	C	2827	4500	D
From Bothwell Street to Florida Street	2320	4500	C	2930	4500	D
From Florida Street to Lee Street	2327	4500	C	3080	4500	D
From Lee Street to Spencer Street	2565	4500	D	3123	4500	D
From Spencer Street to Market Street	2528	4500	D	3123	4500	D
From Market Street to Lutheran Street	2510	4500	D	2618	4500	D
From Lutheran Street to Sullivan Street	2515	4500	D	2624	4500	D
From Sullivan Street to Bessemer Avenue	2515	4500	D	2413	4500	D
From Bessemer Avenue to Wendover Avenue	2636	4500	D	2358	4500	C
From Wendover Avenue to Woodside Drive	2932	4500	D	1839	4500	C
From Woodside Drive to Gatewood Avenue	2935	4500	D	1839	4500	C
From Gatewood Avenue to Textile Drive	2936	4500	D	1830	4500	C
From Textile Drive to Phillips Avenue	2877	4500	D	1802	4500	C
From Phillips Ave to Summit Avenue	3341	4500	E	1782	4500	C

[1] *Vehicles Per Hour*

Table 3-4
Mainline Capacity Analysis
PM Peak Hour
2003 Existing Conditions

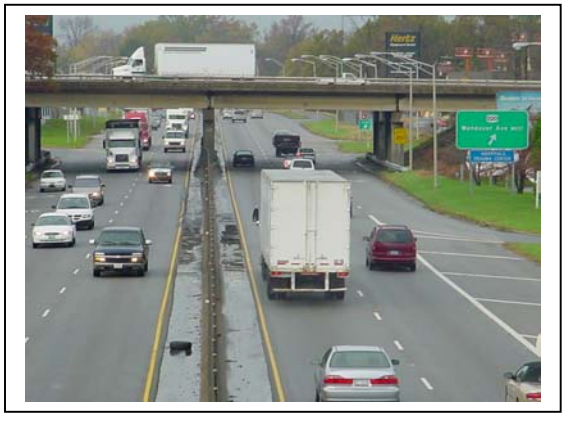
Mainline Section and Corridor Cross-Street	Volume[1]	Capacity[1]	Level of Service	Volume[1]	Capacity[1]	Level of Service
US 29	Southbound Lanes			Northbound Lanes		
From Interstate 85/40 to Bothwell Street	3076	4500	D	2471	4500	D
From Bothwell Street to Florida Street	3076	4500	D	2446	4500	D
From Florida Street to Lee Street	2948	4500	D	2457	4500	D
From Lee Street to Spencer Street	3136	4500	D	2599	4500	D
From Spencer Street to Market Street	3137	4500	D	2599	4500	D
From Market Street to Lutheran Street	2857	4500	D	2433	4500	D
From Lutheran Street to Sullivan Street	2605	4500	D	2457	4500	D
From Sullivan Street to Bessemer Avenue	2605	4500	D	2450	4500	D
From Bessemer Avenue to Wendover Avenue	2426	4500	D	2401	4500	D
From Wendover Avenue to Woodside Drive	2032	4500	C	2609	4500	D
From Woodside Drive to Gatewood Avenue	2035	4500	C	2609	4500	D
From Gatewood Avenue to Textile Drive	2037	4500	C	2596	4500	D
From Textile Drive to Phillips Avenue	1937	4500	C	2570	4500	D
From Phillips Ave to Northern Study Limit	2161	4500	C	3021	4500	D

[1] *Vehicles Per Hour*

US 29 Ramps:

An analysis of 2003 traffic flow conditions on US 29 ramps indicates that traffic volumes on all of the entrance and exit ramps along the US 29 corridor are operating well below their capacity of 1400 vehicles per hour (vph). In fact, the only ramps on which the traffic volumes are greater than 500 vph are the southbound-to-westbound Wendover Avenue ramp during the AM peak period, and the northbound Summit Avenue ramp to northbound US 29 in the PM peak period. Of the 14 full and partial interchanges along the US 29 study corridor, eight ramps have less than 200 vph. Of these eight interchanges, two ramps have traffic volumes of less than 10 vph during the peak periods of the day. These low traffic volumes on several ramps indicate that there are an excessive number of ramps within the US 29 study corridor and that an opportunity exists to reduce the number of interchanges without adversely affecting traffic flow conditions on the remaining ramps. A summary of the US 29 ramp capacity analyses are included in Tables 3-5 and 3-6.

US 29 Northbound Exit/Entrance Ramps at Textile Drive



US 29 looking North from west Market Street

US 29 Northbound Exit Ramp at Phillips Avenue

Table 3-5
Ramp Capacity Analysis
AM Peak Hour
2003 Existing Conditions

US 29 Corridor Cross-Street	Ramp	Volume[1]	Capacity[1]	Over Capacity?	Ramp	Volume[1]	Capacity[1]	Over Capacity?
	Southbound Lanes				Northbound Lanes			
Bothwell Street					Exit	12	1400	NO
					Entrance	115	1400	NO
Florida Street	Entrance	105	1400	NO	Exit	22	1400	NO
	Exit	112	1400	NO	Entrance	172	1400	NO
Lee Street	EB-SB Entrance	55	1400	NO	NB-EB Exit	75	1400	NO
	SB-EB Exit	154	1400	NO	EB-NB Entrance	58	1400	NO
	WB-SB Entrance	60	1400	NO	NB-WB Exit	135	1400	NO
	SB-WB Exit	199	1400	NO	WB-NB Entrance	195	1400	NO
Spencer Street	Entrance	83	1400	NO				
	Exit	46	1400	NO				
Market Street	Entrance	214	1400	NO	NB-EB Exit	411	1400	NO
	Exit	196	1400	NO	EB-NB Entrance	29	1400	NO
					NB-WB Exit	190	1400	NO
					WB-NB Entrance	67	1400	NO
Lutheran Street	Entrance	116	1400	NO	Exit	5	1400	NO
	Exit	121	1400	NO	Entrance	11	1400	NO
Sullivan Street					Exit	259	1400	NO
					Entrance	48	1400	NO
Bessemer Avenue	Entrance	81	1400	NO	Exit	72	1400	NO
	Exit	202	1400	NO	Entrance	17	1400	NO
Wendover Avenue	EB-SB Entrance	201	1400	NO	NB-EB Exit	329	1400	NO
	SB-EB Exit	178	1400	NO	EB-NB Entrance	173	1400	NO
	WB-SB Entrance	219	1400	NO	NB-WB Exit	494	1400	NO
	SB-WB Exit	538	1400	NO	WB-NB Entrance	131	1400	NO
Woodside Drive	Entrance	2	1400	NO				
	Exit	5	1400	NO				
Gatewood Avenue	Entrance	8	1400	NO	Exit	14	1400	NO
	Exit	9	1400	NO	Entrance	5	1400	NO
Textile Drive	Entrance	68	1400	NO	Exit	41	1400	NO
	Exit	9	1400	NO	Entrance	13	1400	NO
Phillips Avenue					Exit	136	1400	NO
Summit Avenue	Exit	464	1400	NO	Entrance	116	1400	NO

[1] Vehicles Per Hour

Table 3-6
Ramp Capacity Analysis
PM Peak Hour
2003 Existing Conditions

US 29 Corridor Cross-Street	Ramp	Volume[1]	Capacity[1]	Over Capacity?	Ramp	Volume[1]	Capacity[1]	Over Capacity?
	Southbound Lanes				Northbound Lanes			
Bothwell Street					Exit	71	1400	NO
					Entrance	46	1400	NO
Florida Street	Entrance	208	1400	NO	Exit	96	1400	NO
	Exit	80	1400	NO	Entrance	107	1400	NO
Lee Street	EB-SB Entrance	51	1400	NO	NB-EB Exit	29	1400	NO
	SB-EB Exit	142	1400	NO	EB-NB Entrance	120	1400	NO
	WB-SB Entrance	74	1400	NO	NB-WB Exit	110	1400	NO
	SB-WB Exit	171	1400	NO	WB-NB Entrance	161	1400	NO
Spencer Street	Entrance	58	1400	NO				
	Exit	59	1400	NO				
Market Street	Entrance	400	1400	NO	NB-EB Exit	216	1400	NO
	Exit	120	1400	NO	EB-NB Entrance	61	1400	NO
					NB-WB Exit	112	1400	NO
					WB-NB Entrance	101	1400	NO
Lutheran Street	Entrance	296	1400	NO	Exit	16	1400	NO
	Exit	44	1400	NO	Entrance	40	1400	NO
Sullivan Street					Exit	168	1400	NO
					Entrance	161	1400	NO
Bessemer Avenue	Entrance	250	1400	NO	Exit	83	1400	NO
	Exit	71	1400	NO	Entrance	34	1400	NO
Wendover Avenue	EB-SB Entrance	463	1400	NO	NB-EB Exit	242	1400	NO
	SB-EB Exit	100	1400	NO	EB-NB Entrance	518	1400	NO
	WB-SB Entrance	209	1400	NO	NB-WB Exit	233	1400	NO
	SB-WB Exit	178	1400	NO	WB-NB Entrance	165	1400	NO
Woodside Drive	Entrance	3	1400	NO				
	Exit	6	1400	NO				
Gatewood Avenue	Entrance	7	1400	NO	Exit	26	1400	NO
	Exit	9	1400	NO	Entrance	13	1400	NO
Textile Drive	Entrance	111	1400	NO	Exit	78	1400	NO
	Exit	11	1400	NO	Entrance	52	1400	NO
Phillips Avenue					Exit	114	1400	NO
Summit Avenue	Exit	224	1400	NO	Entrance	558	1400	NO

[1] Vehicles Per Hour

Intersection Capacity Analysis:

Capacity analyses were performed at US 29 ramp intersections with cross-streets and at other intersections that may be affected by changes in access to US 29. This analysis indicates that of the total 23 intersections along the study corridor all of the intersections function with little traffic delay except at the following three locations:

Lee Street at Duke Street: The left-turn movement from southbound Duke Street to eastbound Lee Street currently experiences long delays and functions at level of service F during both the AM and PM peak periods of the day. This approach is controlled by a stop sign.

Market Street at Gillespie Street: The five-legged intersection currently operates at level of service C. However, the right-turn movement from northbound US 29 to eastbound Market Street functions at level of service E during both the AM and PM peak periods of the day. This intersection is controlled by a traffic signal. GDOT is currently planning improvements that will eliminate one leg of the intersection.

Wendover Avenue at Arnold Street/US 29 southbound ramps: The right-turn movement from southbound US 29 entrance ramp to westbound Wendover Avenue functions at level of service F in the AM peak period. However, it functions at level of service A during the PM peak period. The high traffic volumes on westbound Wendover Avenue are due to travel demand towards the downtown employment center in Greensboro in the AM peak hour. This approach is controlled by a stop sign.

Table 3-7 presents the analysis of AM and PM peak hour intersection traffic conditions.

Market Street at Huffman/Gillespie Street

Table 3-7
Intersection Capacity Analysis
AM and PM Peak Hour
2003 Existing Conditions

Intersection	Controlle[1]	AM Peak						PM Peak					
		EB	WB	NB	SB	Other	Inter[2]	EB	WB	NB	SB	Other	Inter [2]
Florida St. @ Eaton Dr.	Stop	A	A	B	C	-	-	A	A	B	B	-	-
Florida St. @ Hooks St.	Stop	-	A	B	-	-	-	-	A	B	-	-	-
Lee St. @ Benbow Rd.	Signal	B	B	C	C	-	A	B	B	C	C	-	B
Lee St. @ Eastside Dr.	Stop	-	A	B		-	-	-	B	C		-	-
Lee St. @ Duke St.	Stop	B	A	C	F	-	-	A	B	D	F	-	-
Duke St. @ US 29 SB Ramps	Stop	A	A	A	B	-	-	A	A	A	B	-	-
Lee St. @ Hackett St. /US 29 NB Ramps	Stop	-	-	B	B	-	-	-	-	B	B	-	-
Hackett St. @ Gorrell St.	Stop	-	A	B	-	-	-	A	B	-	-	-	-
McConnell St. @ O'Henry Blvd. SB	Stop	A	A	A	B	-	-	A	A	B	C	-	-
McConnell St. @ O'Henry Blvd. NB	Stop	-	A	-	B	-	-	-	A	-	B	-	-
Spencer St. @ O'Henry Blvd. SB	Stop	A	A	A	A	-	-	A	A	A	A	-	-
Market St. @ US 29 SB Ramps	Signal	A	A		B		A	B	A	-	B	-	B
Market St. @ Gillespie St.	Signal	C	B	C	C	E[3]	C	D	C	B	C	C[1]	C
Sullivan St. @ Post. St.	Stop	A	-	-	B	-	-	A	-	-	C	-	-
Post. St. @ US 29 NB Ramps	Stop	A	-	A	-	-	-	A	-	A	-	-	-
Bessemer Ave. @ Headquarters Dr./Tucker St.	Stop	A	A	B	B	-	-	A	A	B	B	-	-
Arnold St. @ US 29 SB Ramps	Stop	-	B	-	A	-	-	-	B	-	A	-	-
Tucker St. @ US 29 NB Ramps	Stop	A	A	B	B	-	-	A	A	C	B	-	-
Wendover Ave. @ Arnold St. / US 29 SB Ramps	Stop	-	-	C	F	-	-	-	-	D	C	-	-
Summit Ave. @ Phillips Ave.	Signal	-	B	-	C	C[4]	C	-	B	-	C	C[4]	C
Ball St. @ Summit Ave. NB Exit Ramp	Stop	A		A	B	-	-	A	-	B	B	-	-
Phillips Ave. @ Ball St.	Stop	-	A	C	-	-	-	-	A	C	-	-	-
Phillips Ave. @ White St. /Tucker St.	Stop	A	A	D	C	-	-	A	A	D	C	-	-

[1] Intersection controlled by a traffic signal or a stop sign
[2] Intersection Level of Service
[3] Northeast-bound approach
[4] Southwest-bound approach

3.3 Safety Analysis

As part of the US 29 Corridor Access Management Study, an evaluation was performed of the accidents that have occurred along the US 29 study corridor from immediately north of I-85/I-40 to Summit Avenue. The data provided by GDOT and the NCDOT for the three-year study period from January 2000 through December 2002 were categorized by accident location, type and number. The analysis of the accident history provides an indication of roadway safety conditions in the corridor.

For the period from 2000 through 2002, there were 361 total accidents for the 3.6-mile study corridor. The accidents can be grouped into the following five categories:

- Rear-end collision;
- Loss of control (ran-off-road and hitting a fixed object, parked vehicle, animal, or pedestrian);
- Angle and turning movements;
- Sideswipe and improper lane changes; and
- Other

Figure 3-3 and Table 3.8 presents the number of accidents by type along the US 29 study corridor for the three year study period. As presented, the most common type of accidents are loss of control (38%) and rear-end collisions (37%). Another 24% of the accidents were attributed to sideswipes and improper lane change accidents.

For purposes of aggregation of the accident data, the US 29 study corridor has been divided into eight segments. Figure 3-4 is a bar chart summarizing the accident data by type for these segments. The highest frequency of collisions occur within the segment of the corridor from the Florida Street to Lee Street interchanges and in the area near Bessemer Avenue. The highest total number of accidents occurred in the vicinity of Florida Street and Lee Street with 143 accidents occurring during the three-year study period. This corresponds to a rate of 175 accidents per 100 million vehicle miles of travel, which is about the same as the statewide average of 180 accidents per 100 million vehicle miles of travel for a four-lane, divided urban highway with full access control. The segment between Sullivan Street and Textile Drive is another high accident area, with a rate of 215 accidents per 100 million vehicle miles of travel, which is a rate approximately 20 percent higher than the statewide average. Figure 3-5 summarizes the accident rate along the US 29 study corridor and compares the accident rate to the statewide average.

Table 3-8
Mainline Accidents by Type
Years 2000 - 2002

SEGMENT OF US 29	TOTAL	Rear-end		Loss-of-Control		Sideswipe		Angle		Other *	
		No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total
Segment 1 - Bothwell Street Area	11	2	18%	6	55%	2	18%	1	9%	0	0%
Segment 2 – Florida Street Area	57	32	56%	17	30%	8	14%	0	0%	0	0%
Segment 3 - Lee Street Area	86	30	35%	30	35%	26	30%	0	0%	0	0%
Segment 4 – Market Street Area	38	12	32%	13	34%	13	34%	0	0%	0	0%
Segment 5 – Sullivan Street Area	27	7	26%	11	41%	9	33%	0	0%	0	0%
Segment 6 – Wendover Avenue Area	74	30	41%	27	36%	16	22%	0	0%	1	1%
Segment 7 – Textile Drive Area	30	4	13%	18	60%	8	27%	0	0%	0	0%
Segment 8 - Phillips Avenue Area	38	17	45%	15	39%	6	16%	0	0%	0	0%
TOTAL	361	134	37%	137	38%	88	24%	1	0%	1	0%

* Other includes accidents caused by head-on collisions; or collisions with animal, parked vehicle, or pedestrian.
Source: Greensboro Department of Transportation and North Carolina Department of Transportation

Figure 3-3
Number of Accidents by Type
Years 2000 – 2002

Figure 3-4
Number of Accidents by Segment
Years 2000 – 2002

Figure 3-5
Accident Rate Years 2000 - 2002

The accident data are graphically represented on Figure Series 3-6 at the end of this section. These figures summarize the accident data for the US 29 mainline and show the approximate location, type and number of accidents that have occurred within the study corridor during the three-year study period. Tables A-1 through A-20 in Appendix A of this report list the accident data in a tabular format. A brief summary of the accident conditions on each of the nine segments along the US 29 study corridor is given below:

Segment 1: Bothwell Street Area

- The total number of accidents for this segment is 11.
- The highest number of accidents by type are loss of control (64%), rear-end (18%) and sideswipe/lane change (18%) collisions.
- The primary causes of these accidents are poor horizontal sight distance for vehicles traversing the curve from I-85/I-40, and narrow lanes and shoulders.

Segment 2: Florida Street Area

- The total number of accidents for this segment is 57.
- The highest number of accidents by type are rear-end (56%) and loss of control (30%) collisions.
- The primary causes of these accidents are poor sight distance, short acceleration/deceleration lanes and narrow lanes and shoulders.

Segment 3: Lee Street Area

- The total number of accidents for this segment is 86.
- The highest number of accidents by type are rear end (35%), loss of control (35%) and lane change/sideswipes (30%) collisions.
- The primary causes of these accidents are poor sight distance, short acceleration/deceleration lanes. Many of the rear-end collisions were multi-car accidents.

Segment 4: Market Street Area

- The total number of accidents for this segment is 38.
- The highest number of accidents by type are loss of control (34%), sideswipe/lane change (34%) and rear-end (32%) collisions.
- The primary causes of these accidents are narrow lanes and shoulders, short merge/diverge and weaving lanes.

Segment 5: Sullivan Street Area

- The total number of accidents for this segment is 27.
- The highest number of accidents by type are loss of control (41%), sideswipe/lane change (33%) and rear-end (26%) collisions.
- The primary causes of these accidents are narrow lanes and shoulders and short weaving sections and short acceleration/deceleration lanes.

Segment 6: Bessemer Avenue Area

- The total number of accidents for this segment is 50.
- The highest number of accidents by type are rear end (41%), loss of control (36%), and sideswipes/lane change (22%).
- The primary causes of these accidents are narrow lanes and shoulders, short acceleration/deceleration lanes and short weaving sections.

Segment 7: Textile Drive Area

- The total number of accidents for this segment is 30.
- The highest number of accidents by type are loss of control (60%) and lane change/sideswipe (27%) collisions.
- The primary causes of these accidents are narrow lanes and shoulders, short ramps at sharp angles to US 29 and confusing exit and entrance ramps.

Segment 8: Phillips Avenue Area

- The total number of accidents for this segment is 38.
- The highest number of accidents by type are rear-end (45%) and loss of control (39%) collisions.
- The primary causes of these accidents are driver confusion because of unusual interchange configuration and narrow lanes and shoulders.

Figure 3-6
Collision Diagrams Years 2000 - 2002

4.0 ALTERNATIVE ACCESS MANAGEMENT PLANS

This section presents a detailed description of the alternative transportation corridor improvements that have been considered for the US 29 study corridor. The alternatives were presented to the steering committee and to the public before a final plan was developed.

4.1 Overview

The US 29 Corridor Access Management Plan proposes to reduce the number of interchange access and egress points in order to improve operations and safety of travel along the corridor while maintaining sufficient access to the surrounding communities. One of the study's goals were to maintain full interchange access at three major cross-streets: Lee Street, Market Street and Wendover Avenue. Consideration was also given to changing access at the remaining interchanges: Bothwell Street, Florida Street, Spencer Street, Lutheran Street, Sullivan Street, Bessemer Avenue, Woodside Drive, Gatewood Avenue, Textile Drive, Phillips Avenue and Summit Avenue.

4.2 Alternative Plans

Depending on the complexity of the travel conditions along the US 29 corridor either one or two alternative plans were proposed for each interchange or access location. The plans were then presented to the steering committee and to the public at community meetings before a final plan was selected.

Bothwell Street:

Because of the proximity of Bothwell Street to I-85/I-40 and the poor sight distance along the horizontal curve, the study proposed closing both the US 29 northbound exit and entrance ramps to Bothwell Street. With the US 29 ramps eliminated, the weaving section between the northbound US 29 entrance ramp at Bothwell Street and the exit ramp at Hooks Street is eliminated. Traffic using Bothwell Street today would use Hooks Street to gain access to the area.

The outside through-lane on US 29 can also be widened through the horizontal curve, creating an additional margin of safety for vehicles maneuvering the curve. The Bothwell Street improvements are illustrated in Figure Series 4-1 (sheet 1 of 8).

Florida Street:

Two alternative plans were developed for improvement of the Florida Street ramps. Both alternatives include drainage improvements planned by NCDOT to install drop inlets along the median wall.

Alternative 1 proposed that the US 29 northbound Hooks Street exit and entrance ramps remain open. If funds are available, the horizontal curve radius at the ramp terminal could be increased to improve safety at the terminal. The entrance ramp would remain as it is today.

Alternative 1 also proposed closing both the US 29 northbound exit and entrance ramps at Eton Drive. Under this alternative, southbound traffic on US 29 that currently exits onto Eton Drive would use the Lee Street exit to gain access to the community and the traffic that uses the US 29 entrance ramp to access I-85/I-40 would use the Martin Luther King Jr. Drive ramp.

Alternative 1 for the Florida Street area is illustrated in Figure Series 4-1 (sheet 2A of 8).

Alternative 2 proposed that the US 29 northbound Hooks Street exit and entrance ramps be closed. Traffic that currently uses the Hooks Street exit ramp would use the interchange of Martin Luther King, Jr. Drive with I-85/I-40 to access Florida Street and use the Lee Street interchange to access US 29.

Alternative 2 proposed that the southbound exit ramp at Eton Drive be eliminated and the deceleration lane be re-striped as a shoulder. The entrance ramp would be extended with sufficient distance in the acceleration lane to allow for vehicles to reach mainline speeds before merging into traffic. Under this alternative, southbound traffic on US 29 that currently exits onto Eton Drive would use the Lee Street exit to gain access to the community.

Alternative 2 for the Florida Street area is illustrated in Figure Series 4-1 (sheet 2B of 8).

Lee Street:

Because Lee Street is a major east-west thoroughfare through eastern Greensboro, full access should be maintained. Lee Street currently functions as the designated route to and from I-85/I-40 east of Greensboro. Two alternatives were presented for the Lee Street interchange. For both alternatives, the sidewalk along US 29 on both sides of the roadway would be removed and the right-of-way landscaped to improve the corridor's appearance.

Alternative 1 as shown in Figure Series 4-1 (sheet 3A of 8) proposed closing the eastbound Lee Street-to-northbound US 29 entrance ramp and diverting that traffic to the northbound US 29 entrance ramp at Hackett Street. This would eliminate the

weaving section on northbound US 29 between the Lee Street entrance and exit ramps. To accommodate the additional left-turning traffic on eastbound Lee Street at Hackett Street, this alternative proposed that an eastbound left-turn lane be added to Lee Street at the intersection. Left turns would be prohibited from Hackett Street, thus eliminating the need for a traffic signal at the intersection.

Alternative 1 also recommended closing the westbound Lee Street-to-southbound US 29 entrance ramp. To improve the safety and operations at the intersection of Duke Street at southbound US 29 ramps, the following improvements are also recommended at this intersection:

- Close the access to and from the segment of Duke Street that extends to the north of this intersection. The segment of Duke Street traffic would use Gorrell Street and Benbow Road to gain access to Lee Street. The southern segment of Duke Street would remain the same.
- Close the segment of the existing US 29 two-way entrance and exit ramp that connects the Duke Street intersection with Lee Street.
- The remaining segment of the US 29 ramp would be modified to become a one-way street for much of its length. This US 29 ramp would remain two-way for part of its length closer to Lee Street to provide access to the three residences along that segment of the ramp.

At the intersection of Duke Street and Lee Street, the left turning movement from southbound Duke Street, currently experiences long delays and functions at level of service F during both the AM & PM peak periods of the day. Alternative 1 recommended eliminating this left turn and thus improving the safety and operations at this intersection. Traffic turning left from southbound Duke Street, would be diverted to the southbound US 29 exit ramp at Eastside Drive.

By eliminating the westbound Lee Street-to-southbound US 29 entrance, the substandard weaving section on southbound US 29 in this area would be eliminated. The traffic currently using this US 29 entrance ramp would be diverted to the US 29 entrance ramp from Lee Street at Eastside Drive. To accommodate the additional westbound left-turning traffic from Lee Street at Eastside Drive, this alternative proposed realigning the Eastside Drive approach to the intersection east of Benbow Road and re-striping Lee Street for a westbound left-turn lane at the Eastside Drive intersection. It should be noted that there may be some additional conflicts with left-turning traffic from Lee Street onto Benbow Road, however they are expected to be minimal due to low left-turning traffic movement at this location. The improved safety on US 29 that would result from this improvement is a significant benefit as compared to the additional traffic delays that would occur on Lee Street between these two closely-spaced intersections.

Alternative 1 incorporates NCDOT Transportation Improvement Project No. B-3174. The proposed bridge replacement project plans to upgrade Bridge No. 306 to current design standards. The improvements include replacing the bridge structure on US 29

over Lee Street by increasing travel lane widths, increasing shoulder widths of the roadway approaching and on the proposed structure and widening the auxiliary lanes between the Lee Street entrance and exit ramps.

Alternative 2 proposed no changes to the US 29 northbound exit and entrance ramps south of Lee Street but recommended closing the exit and entrance ramps at Gorrell Street north of Lee Street. This would eliminate the substandard weaving section on US 29 northbound between these two ramps. With the proposed closure of exit and entrance ramps at Gorrell Street, the auxiliary lane between Lee Street and Market Street can be extended to provide sufficient distance for weaving movements between these two ramps.

If the exit ramp is closed at Gorrell Street, all northbound US 29 traffic will enter from and exit to Lee Street via the US 29 ramp south of Lee Street. This will require that the ramp intersection at Lee Street be redesigned to permit left turns from the US 29 northbound exit ramp onto westbound Lee Street and from westbound Lee Street onto the northbound US 29 ramp. With this alternative, the intersection of the US 29 northbound ramp with Lee Street would need to be controlled by a traffic signal.

To facilitate traffic flow through the intersection, this alternative recommended closing access from Hackett Street directly onto Lee Street and diverting all Hackett Street traffic to Lincoln Street one block to the east.

Alternative 2 also recommended closing the westbound Lee Street-to-southbound US 29 entrance ramp. To avoid the confusion at the intersection of Duke Street at southbound US 29 ramps, the following improvements are also recommended at this intersection:

- Close the access to and from the segment of Duke Street that extends to the north of this intersection. This segment of Duke Street traffic would use Gorrell Street and Benbow Road to gain access to Lee Street. The southern segment of Duke Street would remain the same.
- Close the segment of the existing US 29 two-way entrance and exit ramp that connects the Duke Street intersection with Lee Street.
- The remaining segment of the US 29 ramp would be modified to become a one-way street for much of its length. This US 29 ramp would remain two-way for part of its length closer to Lee Street to provide access to the three residences along that segment of the ramp.

Alternative 2 recommended closing the exit ramp from US 29 to Eastside Drive also. Traffic using this exit ramp will be directed to eastbound Lee Street via the existing southbound US 29-to-westbound Lee Street ramp (the ramp that is to the north of Lee Street). This would require that the ramp intersection at Lee Street be redesigned to provide separate left and right-turn lanes at this intersection

As with Alternative 1, all Lee Street traffic entering southbound US 29 would use the Eastside Drive ramp. To accommodate the additional westbound left-turning traffic from Lee Street at Eastside Drive, this alternative proposed realigning the Eastside Drive approach to the intersection east of Benbow Road and re-striping Lee Street for a westbound left-turn lane at the Eastside Drive intersection. It should be noted that there may be some additional conflicts with left-turning traffic from Lee Street onto Benbow Road, however they are expected to be minimal due to low left-turning traffic movement at this location. The improved safety on US 29 that would result from this improvement is a significant benefit as compared to the additional traffic delays that would occur on Lee Street between the two closely-spaced intersections.

By eliminating the westbound Lee Street entrance ramp and the eastbound Lee Street exit ramp on US 29, the substandard weaving section on southbound US 29 in this area is eliminated.

Alternative 2 for the Lee Street area is illustrated in Figure Series 4-1 (sheet 3B of 8).

Spencer Street:

The only alternative proposed for the southbound Spencer Street ramps is to close both the exit and entrance ramps, remove the excess pavement and landscape the area to improve the corridor's appearance. Traffic using the Spencer Street ramp would be diverted to the Market Street and Lee Street interchanges. Figure Series 4-1 (Sheet 3A and 3B) of 8 illustrate the Spencer Street improvements.

Market Street:

Because Market Street is a major east-west thoroughfare through the City of Greensboro, full interchange access to US 29 should be maintained.

The NCDOT currently has plans to realign and improve the US 29 northbound ramps at the Market Street interchange. The project will eliminate the northbound US 29-to-eastbound Market Street exit ramp and the eastbound Market Street-to-northbound US 29 entrance ramp in the southeast quadrant of the interchange. This would eliminate the weaving section on northbound US 29 between the Market Street entrance and exit ramps. The existing westbound Market Street exit and entrance ramps in the northeast quadrant of the interchange will be used by all northbound US 29 exiting and entering traffic in the future. With the proposed closure of exit and entrance ramps at eastbound Market Street, the auxiliary lane between Lee Street and westbound Market Street can be extended to provide sufficient distance for weaving movements between these two ramps.

By eliminating the ramps from the southeast quadrant of the interchange, the intersection of Market Street with Gillespie Street could be redesigned as a four-way

intersection with the realigned US 29 northbound exit and entrance ramps as the north leg of the intersection.

No change was proposed for the US 29 southbound exit and entrance ramps at Market Street.

The sidewalk along US 29 between Lee Street and Market Street should be removed and the right-of-way landscaped to improve the appearance of the corridor. NCDOT also plans to install drop inlets along the median wall to improve drainage across US 29.

Figure Series 4-1 (sheet 4 of 8) illustrates the Market Street interchange improvements.

Lutheran Street:

Access to and from US 29 via Lutheran Street and via Sullivan Street may be important in maintaining access to the NCA&T State University. To accommodate the University's concerns, two alternative plans were proposed for the Lutheran Street ramps. Both alternatives propose closing the US 29 northbound exit and entrance ramps at Lutheran Street, removing excess pavement and landscaping the right-of-way. This would eliminate the weaving section on northbound US 29 between Market Street and Sullivan Street. With the proposed closure of exit and entrance ramps at Lutheran Street, the auxiliary lane between Market Street and Sullivan Street can be extended to provide sufficient distance for weaving movements between these two ramps.

Alternative 1 proposed closing the US 29 northbound exit and entrance ramps at Lutheran Street; but maintains the US 29 southbound exit and entrance ramps at Lutheran Street. Figure Series 4-1 (sheet 5A of 8) illustrates the Lutheran Street improvements for Alternative 1.

Alternative 2 also proposed closing the US 29 southbound entrance and exit ramps on the NCA&T State University campus at Lutheran Street. This alternative would eliminate a weaving section on southbound US 29 between Lutheran Street and Market Street. Figure Series 4-1 (sheet 5B of 8) illustrates the Lutheran Street improvements for Alternative 2.

The two alternative plans were discussed with NCA&T State University before the final plan was developed.

Sullivan Street:

Access to and from US 29 via Lutheran Street and via Sullivan Street may be important in maintaining access to the NCA&T State University. To accommodate the University's concerns, two alternative plans were proposed for the Sullivan Street ramps.

Alternative 1 proposed maintaining the US 29 northbound exit and entrance ramps at Sullivan Street (Post Street). Figure Series 4-1 (sheet 5A of 8) illustrates the Sullivan Street improvements for Alternative 1.

Alternative 2 proposed closing the Sullivan Street (Post Street) exit and entrance ramps to and from northbound US 29, thus eliminating a substandard weaving section between the Sullivan Street and Post Street ramps. Figure Series 4-1 (sheet 5B of 8) illustrates the Sullivan Street improvements for Alternative 2. With the proposed closure of exit and entrance ramps at Sullivan Street, the auxiliary lane between Market Street and eastbound Wendover Avenue can be extended to provide sufficient distance for weaving movements between these two ramps.

Bessemer Avenue:

The only alternative proposed for the Bessemer Avenue ramps on northbound US 29 included closing both the northbound US 29 exit and entrance ramps at eastbound Bessemer Avenue. By eliminating the eastbound Bessemer Avenue entrance ramp on northbound US 29, the substandard weaving section on northbound US 29 in this area would be eliminated. With the proposed closure of exit and entrance ramps at Bessemer Avenue, the auxiliary lane between Market Street and eastbound Wendover Avenue can be extended to provide sufficient distance for weaving movements between these two ramps. The Headquarters Drive exit ramp on southbound US 29 would be closed, eliminating the weaving section between the eastbound Wendover Avenue entrance ramp and the Headquarters Drive exit ramp. Traffic from the closed ramps would be diverted to other ramps at the Wendover Avenue interchange.

In addition, NCDOT plans to install drop inlets along the median wall near Headquarters Drive to improve drainage across US 29.

Figure Series 4-1 (sheets 6A and 6B of 8) illustrate the Bessemer Avenue improvements.

Wendover Avenue:

Two alternatives were proposed for the Wendover Avenue interchange. Both the alternatives proposed maintaining all of the ramps on northbound US 29 at Wendover Avenue, which would not eliminate the substandard weaving section in this area. The elimination of this weaving section on US 29 would only be possible by creating a new median opening and adding another signal to Wendover Avenue. However, this would significantly worsen the traffic flow conditions on Wendover Avenue and therefore this improvement was not proposed.

Alternative 1 proposed a minor change on southbound US 29: the ramp terminus at Wendover Avenue will be realigned and controlled by a stop sign to improve visibility

and reduce accidents. Figure Series 4-1 (sheet 6A of 8) illustrates the improvements to the Wendover Avenue interchange for Alternative 1. With the proposed closure of exit and entrance ramps at Textile Drive, Gatewood Avenue and Woodside Drive the deceleration lane for the westbound Wendover Avenue exit ramp can be extended to provide sufficient distance for traffic to reduce speed before exiting at the ramp

As part of long-term improvements, GDOT will consider a new one-way collector-distributor road on US 29 southbound from Wendover Avenue to Bessemer Avenue.

Alternative 2 proposed closing the westbound Wendover Avenue-to-southbound US 29 entrance ramp and diverting traffic from that ramp to the Headquarters Drive entrance ramp via Lindsay Street. This would eliminate the weaving section on southbound US 29 between the entrance and exit ramps at Wendover Avenue. Figure Series 4-1 (sheet 6B of 8) illustrates the improvements to the Wendover Avenue interchange for Alternative 2.

Woodside Drive:

The only alternative that was proposed for Woodside Drive was to close the US 29 southbound exit and entrance ramps, to Woodside Drive, thereby eliminating the substandard weaving sections between Gatewood Avenue, Woodside Drive and Wendover Avenue. Excess pavement would be removed and the area landscaped to improve the appearance of the corridor. Figure Series 4-1 (sheets 7A and 7B of 8) illustrate the proposed improvements to Woodside Drive.

Gatewood Avenue:

Two alternatives were proposed for improvement of the Gatewood Avenue interchange. Both alternatives proposed elimination of the Gatewood Avenue exit and entrance ramps on southbound US 29. However, two different improvements were proposed for the Gatewood Avenue ramps on northbound US 29. The alternatives proposed for Gatewood Avenue and Textile Drive are interrelated.
Both alternatives include drainage improvements proposed by NCDOT to install drop inlets along the US 29 median wall.

Alternative 1 proposed that the US 29 northbound exit and entrance ramps to Gatewood Avenue remain open. On US 29 southbound, the exit and entrance ramps at Gatewood Avenue would be closed, thereby eliminating the substandard weaving section between Textile Drive, Gatewood Avenue and Woodside Drive.

Figure Series 4-1 (sheet 7A of 8) illustrate the improvements to the Gatewood Avenue interchange for Alternative 1.

Alternative 2 proposed that the US 29 northbound exit and entrance ramps at Gatewood Avenue be closed and traffic shifted to Textile Drive. On US 29 southbound, the exit and entrance ramps at Gatewood Avenue would be closed, thereby eliminating the substandard weaving section between Textile Drive, Gatewood Avenue and Woodside Drive.

Figure Series 4-1 (sheet 7B of 8) illustrate the improvements to the Gatewood Avenue interchange for Alternative 2.

Textile Drive:

Two alternative plans were proposed for Textile Drive. The alternatives proposed for Gatewood Avenue and Textile Drive are interrelated.

Alternative 1 proposed that the US 29 northbound exit and entrance ramps at Textile Drive be closed and traffic shifted to the Gatewood Avenue ramps. On southbound US 29 the exit and entrance ramps at Textile Drive would be closed, thereby eliminating the substandard weaving section between Textile Drive, Gatewood Avenue and Woodside Drive. Cut-through traffic in the Rosewood community would be eliminated with this alternative.

Figure Series 4-1 (sheet 7A of 8) illustrates the improvements to the Textile Drive interchange for Alternative 1.

Alternative 2 proposed that the US 29 northbound exit ramp at Textile Drive would remain open and the North O'Henry Boulevard frontage road be changed to a one-way northbound frontage road with an entrance ramp at its northern terminus near Ryan Street. The northbound exit and entrance ramps at Gatewood Avenue would be closed and traffic shifted to Textile Drive.

On southbound US 29 the exit and entrance ramps at Textile Drive would remain open but the ramps at Gatewood Avenue and Woodside Drive would be closed, thereby eliminating the substandard weaving section between Textile Drive, Gatewood Avenue and Woodside Drive.

Figure Series 4-1 (sheet 7B of 8) illustrate the improvements to the Textile Drive interchange for Alternative 2.

Phillips Avenue:

The proposed improvements to the Phillips Avenue interchange are related to the proposed improvements at Ryan Street and White Street.

Alternative 1 proposed that the US 29 northbound exit ramp to Ryan Street be closed and Ryan Street be a continuation of the two-way North O'Henry Boulevard frontage road. Figure Series 4-1 (sheet 7A of 8) illustrates the improvements to Ryan Street for Alternative 1.

Alternative 2 also proposed that the US 29 northbound exit ramp to Ryan Street be closed. North O'Henry Boulevard would be a one-way street for its entire length. Ryan Street would remain as a one-way street and would be connected with the frontage road. Figure Series 4-1 (sheet 7B of 8) illustrates the improvements to Ryan Street for Alternative 2.

For both of these alternatives, it was proposed that White Street be realigned to intersect Phillips Avenue at a right angle across from Tucker Street. This will improve sight distance and reduce accidents at the intersection. Figure Series 4-1 (sheet 8 of 8) illustrate the improvements to the Phillips Avenue/Tucker Street/ White Street intersection.

Summit Avenue:

At Summit Avenue, only one change was proposed for this interchange. Between the northbound Summit Avenue lanes and southbound US 29 lanes, either landscaping or some other type of visual barrier should be installed to provide visual screening of traffic along these parallel and adjacent roadways. Figure Series 4-1 (sheet 8 of 8) illustrates the location where the visual barrier is needed.

4.3 Plan Selection

The proposed improvements were presented to the steering committee and to the public in community meetings held in November 2003. The comments received from these groups were incorporated into the final plan that is presented in Section 5 of this study.

Figure 4-1
Design/Circulation Improvement Alternatives

5.0 RECOMMENDED ACCESS MANAGEMENT PLAN

The comments received from the Steering Committee and from the surrounding communities were used to develop a comprehensive access management, plan for the US 29 study corridor that is reasonable and feasible for implementation by the Greensboro Department of Transportation and the North Carolina Department of Transportation.

5.1 Recommended Improvements

The US 29 access management plan consolidates the interchange access at nine locations from the existing 14 access points. Full interchanges will remain at three locations: Lee Street, Market Street and Wendover Avenue. Partial access will be provided at Florida Street, Lutheran Street, Sullivan Street, Bessemer Avenue, Gatewood Avenue and Summit Avenue. Table 5-1 summarizes the recommended changes in access to and egress from US 29. The recommended improvements are illustrated in Figure Series 5-1 and described below.

Table 5-1
Recommended Improvements
Access/Egress Locations

US 29 Cross-Street	Existing Conditions					Recommended Improvements				
	Type of Access	Southbound		Northbound		Type of Access	Southbound		Northbound	
		Exit	Entrance	Exit	Entrance		Exit	Entrance	Exit	Entrance
Bothwell St.	Partial	-	-	✓	✓	Closure Recommended				
Florida St.	Full	✓	✓	✓	✓	Partial	-	-	✓	✓
Lee St.	Full	✓	✓	✓	✓	Full	✓	✓	✓	✓
Spencer St.	Partial	✓	✓	-	-	Closure Recommended				
Market St.	Full	✓	✓	✓	✓	Full	✓	✓	✓	✓
Lutheran St.	Full	✓	✓	✓	✓	Partial	✓	✓	-	-
Sullivan St.	Partial	-	-	✓	✓	Partial	-	-	✓	✓
Bessemer Ave.	Full	✓	✓	✓	✓	Partial	-	✓	✓	-
Wendover Ave.	Full	✓	✓	✓	✓	Full	✓	✓	✓	✓
Woodside Dr.	Partial	✓	✓	-	-	Closure Recommended				
Gatewood Ave.	Full	✓	✓	✓	✓	Partial	-	-	✓	✓
Textile Dr.	Full	✓	✓	✓	✓	Closure Recommended				
Phillips Ave.	Partial	-	-	✓	-	Closure Recommended				
Summit Ave.	Partial	✓	-	-	✓	Partial	✓	-	-	✓

Bothwell Street:

Because of the proximity of Bothwell Street to I-85/I-40 and the poor sight distance along the horizontal curve, the recommended plan proposes closing both the US 29 northbound exit and entrance ramps to Bothwell Street. With the ramps eliminated the weaving section between the northbound US 29 entrance ramp at Bothwell Street and the exit ramp at Hooks Street is eliminated. Traffic using Bothwell Street today would use Hooks Street to gain access to the area.

The outside through-lane on US 29 can also be widened through the horizontal curve, creating an additional margin of safety for vehicles maneuvering the curve.

Florida Street:

The recommended plan proposes that the Hooks Street exit and entrance ramps on northbound US 29 remain open. If funds are available, the horizontal curve radius at the ramp terminal could be increased to improve safety at the terminal. The entrance ramp would remain as it is today.

The recommended plan also proposes closing both the exit and entrance ramps on southbound US 29 at Eton Drive. Under this recommended plan, southbound traffic on US 29 that currently exits onto Eton Drive would use the Lee Street exit to gain access to the community and the traffic that uses the US 29 entrance ramp to access I-85/I-40 would use the Martin Luther King Jr. Drive ramp.

Lee Street:

Because Lee Street is a major east-west thoroughfare through eastern Greensboro, full access should be maintained. Lee Street currently functions as the designated route to and from I-85/I-40 east of Greensboro.

The recommended plan proposes closing the eastbound Lee Street-to-northbound US 29 entrance ramp and diverting that traffic to the US 29 northbound entrance ramp at Hackett Street. This would eliminate the weaving section on northbound US 29 between the Lee Street entrance and exit ramps. To accommodate the additional left-turning traffic on eastbound Lee Street at Hackett Street, the recommended improvement is that an eastbound left-turn lane be added to Lee Street at the intersection. Left-turns would be prohibited from Hackett Street, thus eliminating the need for a traffic signal at the intersection.

The recommended plan also proposes closing the westbound Lee Street-to-southbound US 29 entrance ramp. To improve the safety and operations at the intersection of Duke

Street at southbound US 29 ramps, the following improvements are also recommended at this intersection:

- Close the access to and from the segment of Duke Street that extends to the north of this intersection. This segment of Duke Street traffic would use Gorrell Street and Benbow Road to gain access to Lee Street. The southern segment of Duke Street would remain the same.
- Close the segment of the existing US 29 two-way entrance and exit ramp that connects the Duke Street intersection with Lee Street.
- The remaining segment of the US 29 ramp would be modified to become a one-way street for much of its length. This US 29 ramp would remain two-way for part of its length closer to Lee Street to provide access to the three residences along that segment of the ramp.

By eliminating the westbound Lee Street-to-southbound US 29 entrance, the substandard weaving section on southbound US 29 in this area would be eliminated. The traffic currently using this US 29 entrance ramp would be diverted to the US 29 entrance ramp from Lee Street at Eastside Drive. To accommodate the additional westbound left-turning traffic from Lee Street at Eastside Drive, the recommended plan proposes realigning the Eastside Drive approach to the intersection east of Benbow Road and re-striping Lee Street for a westbound left-turn lane at the Eastside Drive intersection. It should be noted that there may be some additional conflicts with left-turning traffic from Lee Street onto Benbow Road, however they are expected to be minimal due to minimal left-turning traffic movement at this location. The improved safety on US 29 that would result from this improvement is a significant benefit as compared to the additional traffic delays that would occur on Lee Street between these two closely-spaced intersections.

This recommended plan incorporates NCDOT Transportation Improvement Project No. B-3174. The proposed bridge replacement project plans to upgrade Bridge No. 306 to current design standards. The improvements include replacing the bridge structure on US 29 over Lee Street by increasing travel lane widths, increasing shoulder widths of the roadway approaching and on the proposed structure and widening the auxiliary lanes between the Lee Street entrance and exit ramps.

Spencer Street:

The recommended plan for the US 29 southbound Spencer Street ramps is to close both the exit and entrance ramps, remove the excess pavement and landscape the area to improve the corridor's appearance. Traffic using the Spencer Street ramp would be diverted to Market Street and the Lee Street interchanges.

Market Street:

Because Market Street is a major east-west thoroughfare through the City of Greensboro, full interchange access to US 29 should be maintained.

The NCDOT currently has plans to realign and improve the US 29 northbound ramps at the Market Street interchange. The project will eliminate the northbound US 29-to-eastbound Market Street exit ramp and the eastbound Market Street-to-northbound US 29 entrance ramp in the southeast quadrant of the interchange. With the proposed closure of exit and entrance ramps at eastbound Market Street, the auxiliary lane between Lee Street and Market Street can be extended to provide sufficient distance for weaving movements between these two ramps. The existing westbound Market Street exit and entrance ramps in the northeast quadrant of the interchange will be used by all northbound US 29 exiting and entering traffic in the future.

By eliminating the ramps from the southeast quadrant of the interchange, the intersection of Market Street with Gillespie Street could be redesigned as a four-way intersection with the realigned US 29 northbound exit and entrance ramps as the north leg of the intersection. With the elimination of the eastbound Market Street exit and entrance ramp, the substandard weaving section on northbound US 29 at Market Street will also be eliminated.

No change is proposed for the US 29 southbound exit and entrance ramps at Market Street.

Lutheran Street and Sullivan Street:

Access to and from US 29 via the Lutheran Street and via Sullivan Street may be important in maintaining access to the NCA&T State University. To maintain sufficient access to the University, the recommended plan proposes closing the US 29 northbound exit and entrance ramps at Lutheran Street. Traffic from the US 29 northbound ramps would be diverted to the Sullivan Street interchange. With the proposed closure of exit and entrance ramps at Lutheran Avenue, the auxiliary lane between Market Street and eastbound Wendover Avenue can be extended to provide sufficient distance for weaving movements between these two ramps.

Bessemer Avenue:

The recommended plan for the Bessemer Avenue interchange proposes closing both the northbound US 29 exit and entrance ramps at eastbound Bessemer Avenue. By eliminating the eastbound Bessemer Avenue entrance ramp on northbound US 29, the substandard weaving section on northbound US 29 in this area would be eliminated. With the recommended closure of exit and entrance ramps at eastbound Bessemer

Avenue, the auxiliary lane between Market Street and eastbound Wendover Avenue can be extended to provide sufficient distance for weaving movements between these two ramps. The Headquarters Drive exit ramp on southbound US 29 would be closed, eliminating the weaving section between the eastbound Wendover Avenue entrance ramp and the Headquarters Drive exit ramp. Traffic from the closed ramps at Bessemer Avenue would be diverted to other ramps at the Wendover Avenue interchange.

Wendover Avenue:

The recommended plan proposes only a minor change: the southbound US 29 ramp terminus at westbound Wendover Avenue will be realigned and controlled by a stop sign to improve visibility and reduce accidents.

With the recommended closure of exit and entrance ramps at Textile Drive, Gatewood Avenue and Woodside Drive the deceleration lane for the westbound Wendover Avenue exit ramp can be extended to provide sufficient distance for traffic to reduce speed before exiting at the ramp

As part of long-term improvements GDOT will consider a new one-way collector-distributor road on US 29 southbound from Wendover Avenue to Bessemer Avenue.

Woodside Drive:

The recommended plan proposes to close the US 29 southbound exit and entrance ramps, to Woodside Drive, thereby eliminating the substandard weaving sections between Gatewood Avenue, Woodside Drive and Wendover Avenue. Woodside Drive traffic would be diverted to Wendover Avenue.

Gatewood Avenue:

The recommended improvements for Gatewood Avenue and Textile Drive are interrelated.

The recommended plan proposed that the US 29 northbound exit and entrance ramps at Gatewood Avenue remain open. On US 29 southbound, the exit and entrance ramps at Gatewood Avenue would be closed, thereby eliminating the substandard weaving section between Textile Drive, Gatewood Avenue and Woodside Drive. Traffic from the southbound US 29 ramps at Gatewood Avenue would be diverted to Summit Avenue and Wendover Avenue.

Textile Drive:

The recommended improvements for Gatewood Avenue and Textile Drive are interrelated.

The recommended plan proposed that the US 29 northbound exit and entrance ramps at Textile Drive be closed and traffic shifted to the Gatewood Avenue ramps. On southbound US 29 the exit and entrance ramps at Textile Drive would be closed, thereby eliminating the substandard weaving section between Textile Drive and Gatewood Avenue. Cut-through traffic in the Rosewood community would be eliminated with this alternative. Textile Drive traffic at these southbound US 29 ramps would be diverted to Summit Avenue and Wendover Avenue interchanges.

Phillips Avenue:

The recommended improvements to the Phillips Avenue interchange are related to the recommended improvements at Ryan Street and White Street.

The recommended plan proposes that the US 29 northbound exit ramp to Ryan Street be closed and Ryan Street be a continuation of the two-way North O'Henry Boulevard frontage road. Traffic from this US 29 northbound ramp would be diverted to the Gatewood Avenue ramps.

White Street should be realigned to intersect Phillips Avenue at a right angle across from Tucker Street. This will improve sight distance and reduce accidents at the intersection.

Summit Avenue:

At Summit Avenue, only one change is proposed in the recommended plan. Between the northbound Summit Avenue lanes and southbound US 29 lanes, either landscaping or other visual barrier should be installed to provide visual screening of traffic along these parallel and adjacent roadways.

Figure 5-1
Recommended Improvements

5.2 Traffic Analysis of Recommended Improvements

The traffic analysis conducted for the US 29 recommended access management plan includes analysis of the peak hour travel conditions for the US 29 mainline, ramps and affected intersections within the US 29 study corridor. These analyses were performed in order to estimate the impact of the recommended improvements to the existing travel conditions along study corridor.

5.2.1 Revised Traffic Volumes

After incorporating all of the recommended improvements discussed in Section 5.1, traffic volumes along the US 29 study corridor were revised based on the re-assignment of traffic volumes along the corridor due to the recommended closures or several US 29 ramps.

The traffic capacity analysis for the revised conditions was performed for the same year as the existing conditions, 2003 and therefore no future traffic volume projections was conducted. Traffic volumes for the 2003 revised conditions remained the same as the existing conditions, except for those cases in which a ramp closure is recommended. The traffic volumes diverted from the closed ramp were assigned to a nearby interchange.

Figure series 5-2 shows the 2003 revised peak hour traffic volumes for the US 29 study corridor.

5.2.2 Roadway Capacity Analysis

US 29 Mainline: The capacity analysis of the traffic flow conditions in the US 29 study corridor using the 2003 revised traffic volumes indicates that traffic demand throughout the corridor is accommodated within the current capacity of the highway during all hours of a 24-hour period. Table 5-2 and Table 5-3 summarize the results of the US 29 revised mainline capacity analysis.

During the AM peak period, southbound traffic on US 29 is approaching capacity, level of service E, between Summit Avenue and Phillips Avenue interchanges. Traffic on US 29 southbound between Phillips Avenue and Lee Street flows at level of service D, an acceptable rate of traffic flow for peak hour conditions. The traffic demand on the remaining southbound segment of US 29 between Lee Street and I-85 / 40 operates at level of service C, a good rate of traffic flow. Northbound traffic flows at level of service D between I-85 / 40 and Wendover Avenue. In the remaining northbound section of the US 29 study corridor, traffic flows at level of service C.

Figure 5-2
Traffic Volumes 2003 Revised Conditions

During the PM peak period, southbound traffic on US 29 flows at a level of service C between Summit Avenue and Bessemer Avenue. Traffic on the remaining segments of southbound US 29 between Bessemer Avenue and I-85/I-40 flows at level of service D. Northbound traffic on US 29 flows at level of service D for the entire length of the study corridor.

Table 5-2
Mainline Capacity Analysis
AM Peak Hour
2003 Revised Volumes

Mainline Section and Corridor Crossroad	Volume[1]	Capacity[1]	Level of Service	Volume[1]	Capacity[1]	Level of Service
US 29	Southbound Lanes			Northbound Lanes		
From Interstate 85/40 to Bothwell Street	2215	4500	C	2827	4500	D
From Bothwell Street to Florida Street	2215	4500	C	2827	4500	D
From Florida Street to Lee Street	2215	4500	C	3080	4500	D
From Lee Street to Spencer Street	2482	4500	D	3123	4500	D
From Spencer Street to Market Street	2482	4500	D	3123	4500	D
From Market Street to Lutheran Street	2510	4500	D	2618	4500	D
From Lutheran Street to Sullivan Street	2515	4500	D	2618	4500	D
From Sullivan Street to Bessemer Avenue	2515	4500	D	2413	4500	D
From Bessemer Avenue to Wendover Avenue	2434	4500	D	2413	4500	D
From Wendover Avenue to Woodside Drive	2854	4500	D	1839	4500	C
From Woodside Drive to Gatewood Avenue	2854	4500	D	1839	4500	C
From Gatewood Avenue to Textile Drive	2854	4500	D	1666	4500	C
From Textile Drive to Phillips Avenue	2854	4500	D	1666	4500	C
From Phillips Ave to Summit Avenue	3341	4500	E	1782	4500	C

[1] Vehicles Per Hour

Table 5-3
Mainline Capacity Analysis
PM Peak Hour
2003 Revised Volumes

Mainline Section and Corridor Crossroad	Volume[1]	Capacity[1]	Level of Service	Volume[1]	Capacity[1]	Level of Service
US 29	Southbound Lanes			Northbound Lanes		
From Interstate 85/40 to Bothwell Street	2868	4500	D	2471	4500	D
From Bothwell Street to Florida Street	2868	4500	D	2471	4500	D
From Florida Street to Lee Street	2868	4500	D	2457	4500	D
From Lee Street to Spencer Street	3078	4500	D	2599	4500	D
From Spencer Street to Market Street	3078	4500	D	2599	4500	D
From Market Street to Lutheran Street	2857	4500	D	2433	4500	D
From Lutheran Street to Sullivan Street	2605	4500	D	2433	4500	D
From Sullivan Street to Bessemer Avenue	2605	4500	D	2450	4500	D
From Bessemer Avenue to Wendover Avenue	2355	4500	C	2450	4500	D
From Wendover Avenue to Woodside Drive	1911	4500	C	2609	4500	D
From Woodside Drive to Gatewood Avenue	1911	4500	C	2609	4500	D
From Gatewood Avenue to Textile Drive	1911	4500	C	2456	4500	D
From Textile Drive to Phillips Avenue	1911	4500	C	2456	4500	D
From Phillips Ave to Northern Study Limit	2161	4500	C	3021	4500	D

[1] Vehicles Per Hour

US 29 Ramps: An analysis of the traffic flow conditions on the US 29 ramps using the 2003 revised traffic volumes indicates that traffic volumes on all of the entrance and exit ramps along the US 29 corridor are operating well below their capacity of 1400 vehicles per hour (vph). In fact, the only ramps on which the traffic volumes are greater than 500 vph are the southbound US 29-to-westbound Wendover Avenue ramp during the AM peak period, and the Phillips Avenue entrance ramp on US 29 northbound in the PM peak period. Of the nine interchanges along the US 29 study corridor, six ramps have less than 200 vph. This indicates that the ramp demand is less than one-third of the ramp capacity along US 29. A summary of ramp peak-hour capacity analyses are included in Table 5-4 and Table 5-5.

Table 5-4
Ramp Capacity Analysis
AM Peak Hour
2003 Revised Volumes

US 29 Corridor Cross-street	Ramp	Volume[1]	Capacity[1]	Over Capacity?	Ramp	Volume	Capacity[1]	Over Capacity?
US 29	Southbound Lanes				Northbound Lanes			
Florida Street					Exit	34	1400	NO
					Entrance	287	1400	NO
Lee Street	SB Entrance	198	1400	NO	NB-EB Exit	75	1400	NO
	SB-WB Exit	281	1400	NO	NB-WB Exit	135	1400	NO
	SB-EB Exit	184	1400	NO	Entrance	253	1400	
Market Street	Entrance	214	1400	NO	Exit	601	1400	NO
	Exit	242	1400	NO	Entrance	96	1400	NO
Lutheran Street	Entrance	116	1400	NO				
	Exit	121	1400	NO				
Sullivan Street					Exit	264	1400	NO
					Entrance	59	1400	NO
Bessemer Avenue	Entrance	81	1400	NO				
Wendover Avenue	EB-SB Entrance	279	1400	NO	NB-EB Exit	401	1400	NO
	SB-EB Exit	380	1400	NO	EB-NB Entrance	190	1400	NO
	WB-SB Entrance	219	1400	NO	NB-WB Exit	494	1400	NO
	SB-WB Exit	538	1400	NO	WB-NB Entrance	131	1400	NO
Gatewood Avenue					Exit	191	1400	NO
					Entrance	18	1400	NO
Summit Avenue	Exit	487	1400	NO	Entrance	116	1400	NO

[1] Vehicles Per Hour

Table 5-5
Ramp Capacity Analysis
PM Peak Hour
2003 Revised Volumes

US 29 Corridor Cross-street	Ramp	Volume[1]	Capacity[1]	Over Capacity?	Ramp	Volume	Capacity[1]	Over Capacity?
US 29	Southbound Lanes				Northbound Lanes			
Florida Street					Exit	167	1400	NO
					Entrance	153	1400	NO
Lee Street	SB Entrance	183	1400	NO	EB-NB Entrance	29	1400	NO
	SB-EB Exit	246	1400	NO	NB-WB Exit	110	1400	NO
	SB-WB Exit	147	1400	NO	Entrance	281	1400	NO
Market Street	Entrance	400	1400	NO	Exit	328	1400	NO
	Exit	179	1400	NO	Entrance	162	1400	NO
Lutheran Street	Entrance	296	1400	NO				
	Exit	44	1400	NO				
Sullivan Street					Exit	184	1400	NO
					Entrance	201	1400	NO
Bessemer Avenue	Entrance	250	1400	NO				
Wendover Avenue	EB-SB Entrance	584	1400	NO	NB-EB Exit	325	1400	NO
	SB-EB Exit	171	1400	NO	EB-NB Entrance	552	1400	NO
	WB-SB Entrance	209	1400	NO	NB-WB Exit	233	1400	NO
	SB-WB Exit	178	1400	NO	WB-NB Entrance	165	1400	NO
Gatewood Avenue					Exit	218	1400	NO
					Entrance	65	1400	NO
Summit Avenue	Exit	250	1400	NO	Entrance	565	1400	NO

[1] Vehicles Per Hour

Intersections along US 29:

The traffic capacity analysis for the revised conditions indicates that of the 23 total intersections within the US 29 study corridor, 18 intersections will flow at the same level of service as in the existing conditions. The proposed improvements have an impact on traffic operations at the following five intersections.

Lee Street at Duke Street: The left-turn movement from southbound Duke Street to eastbound Lee Street (traffic coming from southbound US 29-to-eastbound Lee Street) currently experiences long delays and functions at level of service F during both the AM and PM peak periods of the day. This approach is controlled by a stop sign. As part of the recommended improvements, the left-turn would be prohibited at this intersection. This left-turning traffic from southbound US 29-to-eastbound Lee Street would use the Eastside Drive to access eastbound Lee Street. This will improve the capacity of the intersection at Lee Street and Duke Street, which will flow at Level of Service D or better throughout the day, an acceptable rate of flow for the peak conditions.

Duke Street at southbound Ramps: This four-legged stop sign controlled intersection currently operates at level of service B or better through out the day. With the proposed closing of the northern segment of Duke Street and western segment of US 29 southbound ramps all the conflicts to the through movement to and from the southbound US 29 would be eliminated. With this change in the travel pattern, it is recommended to remove the stop sign on Duke Street. This intersection will become a single two-lane street providing access from southbound US 29 and access to and from the residences on this street.

Market Street at Gillespie Street: The five-legged intersection currently operates at level of service C. However, the right-turn from northbound US 29-to-eastbound Market Street functions at level of service E during both the AM and PM peak periods of the day. This intersection is controlled by a traffic signal. The recommendations proposed by NCDOT at this intersection would change the intersection into a four-legged traditional intersection. Considering these improvements, signal timing was adjusted for the 2003 revised conditions. This will improve the intersection flow to level of service C or better throughout the day, good rate of traffic flow for peak conditions.

Bessemer Avenue at Headquarters Drive/Tucker Street: This four-legged stop sign controlled intersection currently operates at level of service B or better through out the day. With the proposed closing of the exit and entrance ramps on northbound US 29 at Headquarters Drive, the northbound leg of this intersection will be closed. This traffic would be directed to eastbound Bessemer Avenue via Tucker Street, which is the southbound leg of the same intersection. This improvement would add an additional southbound left turning movement of 68 vehicles in the AM peak hour and 79 vehicles in the PM peak hour at this intersection. As a result of this change in the travel pattern, the southbound approach at this intersection will function at level of service E during the PM peak period only. No remedial action is recommended at this location because long delays occur for a only short time during the PM peak hour period. We recommend that the intersection be monitored to determine if left-turn delays on Tucker Street become sufficiently long to warrant further study.

Arnold Street at southbound US 29 Ramp: This three-legged stop sign controlled intersection currently operates at level of service C. With the proposed closing of the exit ramp at Headquarters Drive, the traffic from this exit ramp will be diverted to the exit ramp at Arnold Street. This will increase the number of PM peak hour westbound left-turns from the existing 18 to 89. As a result of this change in the travel pattern, the westbound approach at this intersection will function at level of service E during the PM peak period only, however, this delay is expected to occur for only a short time during the PM peak period. The improved safety of travel on the US 29 mainline would be of greater significance and benefit than the additional delays at this intersection.

Table 5-6 presents the capacity analysis results of the AM and PM peak hour intersection traffic conditions.

Table 5-6
Intersection Capacity Analysis
AM and PM Peak Hour
2003 Revised Volumes

Intersection	Controller [1]	AM Peak						PM Peak					
		EB	WB	NB	SB	Other	Inter[2]	EB	WB	NB	SB	Other	Inter[2]
Florida St. @ Eaton Dr.	Stop	A	A	B	B	-	-	A	A	B	B	-	-
Florida St. @ Hooks St.	Stop	-	A	B	-	-	-	-	A	B	-	-	-
Lee St. @ Benbow Rd.	Signal	B	B	C	D	-	C	B	B	C	D	-	C
Lee St. @ Eastside Dr.	Stop	-	A	B		-	-	-	B	D	-	-	-
Lee St. @ Duke St.	Stop		A	D	C	-	-		B	B	B	-	-
Duke St. @ US 29 SB Ramps		Stop sign removal recommended											
Lee St. @ Hackett St. /US 29 NB Ramps	Stop	B	-	B	B	-	-	B	-	B	B	-	-
Hackett St. @ Gorrell St.	Stop	-	A	B	-	-	-	A	B	-	-	-	-
McConnell St. @ O'Henry Blvd. SB	Stop	A	A	A	B	-	-	A	A	B	C	-	-
McConnell St. @ O'Henry Blvd. NB	Stop	-	A	-	B	-	-	-	A	-	B	-	-
Spencer St. @ O'Henry Blvd. SB	Stop	A		A	A	-	-	A		A	A	-	-
Market St. @ US 29 SB Ramps	Signal	A	A		B		A	B	A	-	B	-	A
Market St. @ Gillespie St.	Signal	C	C	C	B		C	B	B	C	C		B
Sullivan St. @ Post. St.	Stop	A	-	-	B	-	-	A	-	-	C	-	-
Post. St. @ US 29 NB Ramps	Stop	A	-	A	-	-	-	B	-	A	-	-	-
Bessemer Ave. @ Headquarters Dr./Tucker St.	Stop	A			C	-	-	A			E	-	-
Arnold St. @ US 29 SB Ramps	Stop	-	C	-	A	-	-	-	E	-	A	-	-
Tucker St. @ US 29 NB Ramps	Stop	A	A	B	B	-	-	A	A	C	C	-	-
Wendover Ave. @ Arnold St. / US 29 SB Ramps	Stop	-	-	C	F		-	-	-	D	C	-	-
Summit Ave. @ Phillips Ave.	Signal	-	B	-	C	C[3]	C	-	B	-	D	C[4]	C
Ball St. @ Summit Ave. NB Exit Ramp	Stop	A		A	B	-	-	A	-	B	B	-	-
Phillips Ave. @ Ball St.	Stop	-	A	C	-	-	-	-	A	C	-	-	-
Phillips Ave. @ White St. /Tucker St.	Stop	A	A	D	C	-	-	A	A	D	C	-	-

[1] Intersection controlled by a traffic signal or a stop sign
[2] Intersection Level of Service
[3] Southwest-bound approach